

Article

Water Pollution and the Textile Industry in Bangladesh: Flawed Corporate Practices or Restrictive Opportunities?

Maiko Sakamoto ^{1,*}, Tofayel Ahmed ², Salma Begum ³ and Hamidul Huq ³

¹ Department of International Studies, Graduate School of Frontier Sciences, The University of Tokyo, Kashiwanoha, Kashiwa, Chiba 2778563, Japan

² JADE Bangladesh, House # 66, Road # 08, Niketon, Gulkshan-1, Dhaka 1212, Bangladesh; tofayelahmed74@gmail.com

³ Institute of Development Studies and Sustainability, United International University, United City, Madani Avenue, Baridhara, Dhaka 1212, Bangladesh; salma_begum@outlook.com (S.B.); hamidulhuq@eco.uui.ac.bd (H.H.)

* Correspondence: m-sakamoto@k.u-tokyo.ac.jp; Tel.: +81-4-7136-4874

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Abstract: The textile industry in Bangladesh has been a great engine for boosting economic growth in the country. However, with great success came environmental deterioration. Untreated effluents containing heavy metals are being released into rivers from nearby factories, affecting the health of people who live along the polluted rivers. The existing law in Bangladesh, requiring such factories to install an effluent treatment plant (ETP), has not been effective in reducing environmental noncompliance. This paper aims to investigate the reality of the situation that the textile industry faces regarding environmental compliance. It is based on primary data collected from textile factories in Dhaka through a questionnaire survey with complementary interviews. This study especially highlights the barriers and difficulties faced by factories in the installation and operation of ETPs. The results confirm previous findings: Low willingness of companies to meet environmental compliance requirements and inadequate monitoring and enforcement by government authorities. In addition, we reveal that the dominant barriers to ETP installation are at the purchase stage, rather than the construction stage: ETPs are unavailable in local markets and the import tax is high. Institutional arrangements are required to improve this situation; this could include establishing a subsidy scheme that would encourage voluntary construction of central ETPs. We suggest that external pressure is essential for Bangladesh to change and the external bodies exerting such pressure should have objective measures by which to judge compliance; the quality of river water might be the only reliable measure of environmental compliance in this situation.

Keywords: environmental compliance; river pollution; industrial effluent; effluent treatment plant; public policy; state intervention; collective action; international cooperation; Bangladesh

1. Introduction

Bangladesh has achieved rapid economic growth in recent times and aims to become a middle-income country by 2021 [1]. The garment industry has been a great engine for boosting economic growth in Bangladesh. The textile sector has contributed 82% of the country's total export revenue—about 28 billion USD per year—and the export value of the ready-made garment (RMG) sector, the dominant sector in the textile industry, is projected to be about 50 billion USD per year by 2021 [2]. However, with great success came environmental deterioration. Untreated effluent has been discharged into rivers from nearby textile factories, with several major sources of

contaminants being outside the city areas, Gazipur, Tongi, Savar, and Ashulia [3,4]. Figure 1 shows the location of the areas. According to the database of the Department of Inspection for Factories and Establishments, about 3000 garment factories are operating in Dhaka [5]. Wastewater from textile industries in Bangladesh was estimated to be about 217 million m³ in 2016, containing a wide range of pollutants, and will reach 349 million m³ by 2021 if the textile industries continue using conventional dyeing practices [2]. Industrial wastes and effluents containing heavy metals such as vanadium, molybdenum, zinc, nickel, mercury, lead, copper, chromium, cadmium, and arsenic are being released in the vicinity of the industrial areas and this polluted river water is being used for irrigation purposes in paddy and vegetable (spinach, tomato, and cauliflower) cultivation fields near industrial areas in Gazipur and Keraniganj [6]. Vegetable and fruit samples collected from around Savar, Dhamrai, and Tongi show the presence of textile dyes [7]. Through the food chain, this affects the health of people who live along the polluted rivers. The incidence of illness among people living in Hazaribagh is reported 16% higher on average than those living in a control area [8]. The polluted water causes harms such as painful skin disease, diarrhea, food poisoning, and gastrointestinal problems in the short-term, and serious health implications such as respiratory problems when toxic materials accumulate in the body in the long-term [7–9]. The accumulated effect may not be limited to those dwelling around the industrial areas, but could also spread across cities through the poisoned vegetables sold at local markets. The overall impact of such harm to human health is still unknown.

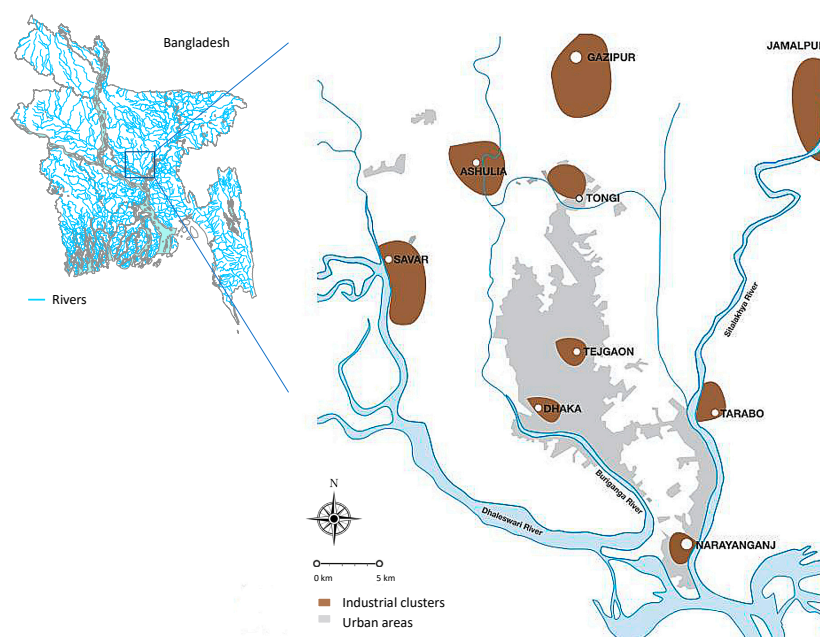


Figure 1. Location of textile industrial areas in Dhaka (adapted from [10]).

The only way to solve the environmental pollution due to industrial effluents is to restrict the polluted discharge at the source. The existing law in Bangladesh, the Environmental Conservation Act (1995), requiring such factories to install an Effluent Treatment Plant (ETP), has not been effective in reducing environmental noncompliance. The ETP is a facility designed to clean industrial effluent for its reuse or safe disposal to the environment. It involves various physical, chemical, biological, and membrane mechanisms to treat waste water. Enforcement of the environmental legislation is the responsibility of the Department of the Environment (DoE), but it has failed to govern the situation although it is fully aware of the non-operation of installed ETPs [11]. The reasons for the enforcement failure are insufficient resources (knowledge, human resources, and funds) [4,12]; economic corruption [4,12]; weak political will [4,13]; and inadequate coordination among concerned agencies [14]. Such lack of enforcement is common in developing countries [15], and Bangladesh is no exception.

Empirical studies on monitoring and enforcement are essential to establish a way forward to mitigate the problem effectively. However, the available data is often quite limited in developed countries, and even more so in developing countries [16]. The reluctance of stakeholders to participate in surveys also greatly hinders researchers from undertaking studies on the subject. In the case of Bangladesh, the DoE has not been recording inspection results in a consistent manner [12], nor sharing the existing data in a transparent way due to internal bureaucracy and pressure from industrial sectors to avoid interference in their business [13]. Under these circumstances, the empirical studies regarding environmental compliance were often based on a very limited number of interviews between 11–50 [4,12,17,18]. In a unique approach, Haque [13,19] collected news articles published from 2011–2016 about fines levied for water pollution by the DoE and created a dataset with 290 records of fines, of which 255 were from the textile industries. Analysis of the penalties revealed that the mean fine amount was 1,965,000 Bangladesh Taka (BDT) (1 USD = 80 BDT), with a maximum of 30,000,000 BDT and a minimum of 10,000 BDT. The estimated annual operating cost for textile dyeing factory is around 13,350,000 BDT [13] and is significantly higher than the average reported fine of 1,965,000 BDT. Moreover, the maximum fine was 3000 times the minimum fine; this suggests how randomly the fines are determined [13]. As such, the penalty for non-compliance is quite inexpensive [20] or even non-existent and, therefore, it is more economically efficient for factories to discharge untreated water and pay the fines [21].

With this context in mind, this paper aims to investigate the real situations that textile industries face regarding environmental compliance. This study especially highlights the barriers and difficulties for factories in installing and operating ETPs. For the environmental pollution from the textile industry in Bangladesh, many studies have been done based on engineering aspects, but few are from a policy point of view, which includes studying barriers at the installation stage of the ETP. The scarcity of such studies stem from the difficulties of getting information from factories. We collected primary data from 23 textile factories in Dhaka through a questionnaire survey with complementary interviews. Combining information of the regulation set-ups and historical process of the problem, we tried to elucidate previously undiscussed drawbacks of the institutions. In the discussion section, to better understand the current situation of the textile industry in Bangladesh as well as to investigate possible solutions to the problem, we include a brief description of the Indian experience with a similar environmental issue that took place in the Indian tannery industry in the 1990s. Our results confirm previous findings about the causes of non-compliance; specifically, low willingness of companies to engage in environmental protection activities and inadequate monitoring and enforcement by government authorities. In addition, we reveal that the respondent textile companies believe the dominant barriers to ETP installation are at the import stage, rather than the construction stage: Unavailability of ETPs in local markets, a high import tax, and options limited by requirements imposed by foreign buyers of the textile outputs. The remedies undertaken by the Indian government resulted in the first central effluent treatment plant (CETP) being in operation just 10 years after the Water Act was adopted in 1981 (in Tamil Nadu state). In comparison, Bangladesh still has no CETPs operating, 24 years after the Environmental Conservation Act was adopted in 1995. Finally, we present recommendations for how Bangladesh can create a more sustainable environment in terms of water quality.

2. Materials and Methods

The questionnaire survey was conducted from July to October 2018. First, we prepared a list with 265 companies with ETPs in Dhaka based on the information provided by the Department of Environment (DoE) and identified textile companies from the list—including those with factories dedicated to textile spinning, weaving, dyeing and finishing, composite mills, knitting, special textiles, and export-oriented RMG. Note that DoE claimed that they have issued ETP installation permission to 1376 textile factories across the country [22] so that the given information was most likely a partial list of textile companies with ETPs in Dhaka. Second, we telephoned some of the identified textile

companies in the list as the initial trial to collect answers for the questionnaire survey, but we found that almost no one was willing to respond to the survey. However, there were a very few showing some positive tendency to participate in the survey on the condition that the data would only be used anonymously. Then, we applied a snowball sampling method to get information. This method consists of two steps: First, potential respondents are identified from the target population and, second, they are asked to provide information about other potential respondents. Thus, a snowball sampling is also called a referral method. We requested the volunteered respondents to introduce other factories, and some agreed. In this way, the size of the sample was increased gradually. After obtaining a consent to participate in the survey from a factory owner, the persons in charge of factory administration were asked to answer the survey questions. A questionnaire was sent by e-mail, and the respondents were asked to collect the information from the relevant persons in the company and to return the completed questionnaire by e-mail. In cases where the respondent failed to send a completed questionnaire then the surveyors (two of the authors) telephoned or visited the factory to collect the responses. In the questionnaire, we asked about the factory profile, the specifications of the installed effluent treatment plant (ETP), the costs of installation and operation of the ETP, as well as the barriers to and difficulties in installation and operation.

3. Results

3.1. Profile of Samples

We collected answers from 23 textile companies. All these companies are furnished with effluent treatment plants (ETPs). Those without ETPs were reluctant to participate in the survey and we were not able to collect information from them. So, we note that our data may be biased and does not depict the problem in its entirety. The full truth is likely worse than depicted because companies with an ETP must be well-off enough to afford ETP installation. Tables 1 and 2 show the basic information about the respondents. The company sizes vary from a small company with 200 employees to a large one with 10,000 employees, with the mean being 1918. These figures are close to those in Haque [19], where the minimum number of employees was 55, the maximum was 8300, and the mean was 1559. Therefore, our data is not too biased in terms of the company size; however, because we were able to cover only companies with ETPs, smaller companies (which usually cannot afford ETPs) were not included. Thus, the minimum number of employees of any company in our sample, 200, was relatively large compared to what is generally considered a small company size.

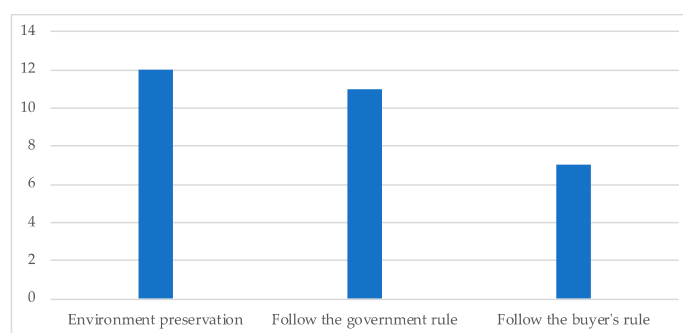
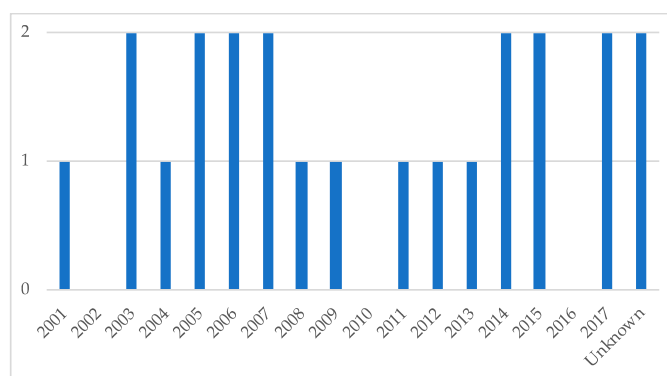
Table 1. Descriptive statistics.

Question	Valid Sample Size	Mean	Standard Deviation	Max	Min
Profile					
Number of employees	22	1918	2609	10,000	200
Facility					
Capacity of treatment (m ³ /day)	23	796	1061	2400	7
Capacity of treatment (m ³ /h)	23	60	61.26	200	0.42
Quantity of treatment (m ³ /day)	18	747	1088	4320	1200
Cost					
Yearly operation cost (BDT)	18	13,923,889	18,334,539	72,000,000	350,000
Installation cost (BDT)	12	25,185,113	18,834,559	60,000,000	2,021,355
Import cost (BDT)	10	17,243,200	14,502,063	40,000,000	852,000
Total import & installation cost (BDT)	13	63,742,566	64,833,116	250,000,000	2,873,355

Table 2. Answers to yes/no questions.

Question	Valid Sample Size	Yes	No
Monitoring and Enforcement			
Has the DoE inspected your facility?	22	22	0
Have you ever been penalized by the DoE?	22	2	20
Installation			
Did somebody recommend it?	23	7	16
Did you get the information by yourself?	22	14	8
Is capacity enough?	23	20	3

Figure 2 shows the reason for ETP installation. This was a multiple-choice question, but only half the respondents selected the response “environmental preservation”. About 29% of the respondents answered that they installed ETPs to follow a foreign buyer’s requirement. Figure 3 shows the years in which the respondents’ ETPs were installed. As it demonstrates, installation of ETPs has been undertaken at a consistent rate of one or two installations per year. There has not been a spike in installations, even though the companies have been under high pressure from foreign buyers as well as the government.

**Figure 2.** Purpose of effluent treatment plant (ETP) set-up.**Figure 3.** Year of installation of effluent treatment plant (ETP).

3.2. Monitoring and Enforcement

It is often pointed out that monitoring and enforcement by the Department of Environment (DoE) are insufficient. According to the results shown in Table 2, 22 out of 23 companies answered that they have been inspected by the DoE. In the subsequent question, only two companies answered that they have ever been penalized by DoE. This seems to suggest that the responding companies are “clean”. However, Figure 4 shows that the DoE’s monitoring is done on a regular basis, mostly at three-month intervals. Therefore, the companies were likely not caught because they knew in advance of the DoE’s inspection and could prepare the ETP, making it operational before the visit. This corresponds to the

interview results of Belal [4]: “The ETP is there but the cost of running it is not feasible and there is no monitoring environment. So, you can set up infrastructure but that will never work. Everybody has a way of knowing when the next inspection will be held.” The amounts of the fines reported by the two penalized companies in our survey were 270,400 BDT and 400,000 BDT. This is within the range of the fines reported by Haque [13]. Even if a factory is fined an average of 1,000,000 BDT twice each year, it would still be more economical to pay the fine rather than running a wastewater treatment plant [20]. So, it was a reasonable transaction for the two penalized companies to pay the fines.

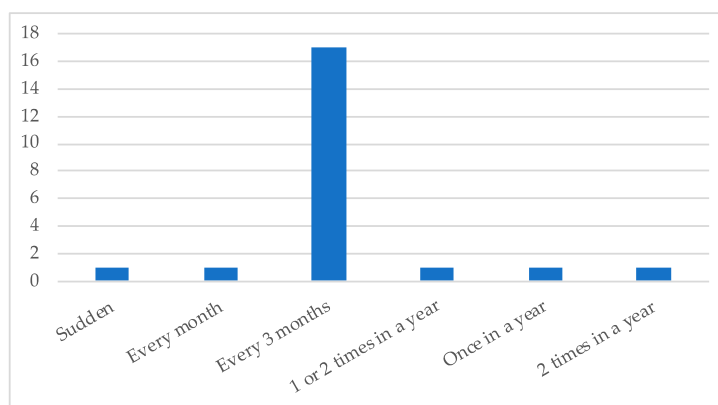


Figure 4. Frequency of monitoring.

3.3. Barriers to ETP Operation

As already noted, non-compliance is more economical for companies than regularly operating an ETP. Table 1 shows the yearly operational costs of ETPs. The mean cost of 13.9 million BDT among the participating companies is almost the same as the average annual operational cost of 13.3 million BDT previously reported for an ETP with around 50 m³/h capacity [13]. The correlation between the yearly operational cost and quantity of treatment per day was 0.54 (p -value = 0.05681). This correlation suggests that more effluent production results in a higher operational cost. The question is whether it is financially feasible or not. Figure 5 shows the top ranked response to the question about barriers to and difficulties in ETP operation, and Figure 6 shows the three highest ranked responses. Based on these results, the major barriers in ETP operation seem to be high running costs and high engineering costs for maintenance. However, the responses related to financial solvency for ETP operation shown in Figure 7 suggest that about 70% of the responding companies did not find the operation to be much of a financial burden. These companies are relatively big, so this tendency may not apply to small companies. But it is worth knowing that financial solvency seems to be regarded by the companies as more or less a manageable problem.

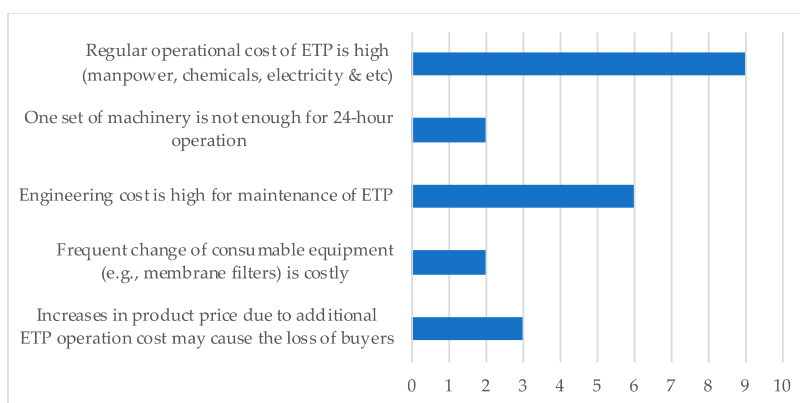


Figure 5. Barriers to or difficulties in effluent treatment plant (ETP) operation (1st rank).

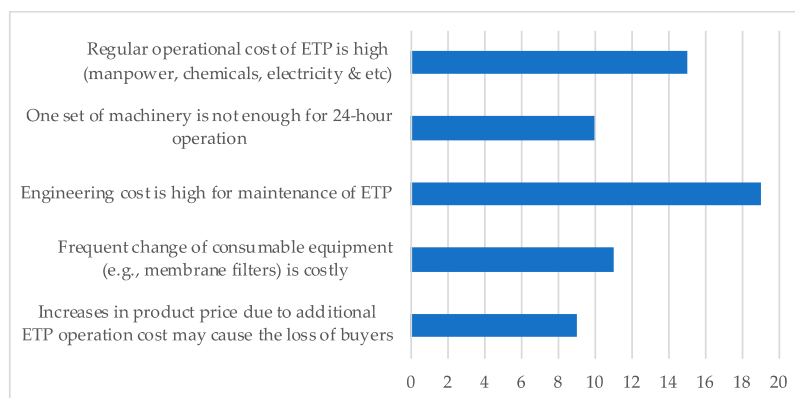


Figure 6. Barriers to or difficulties in effluent treatment plant (ETP) operation (1st–3rd rank).

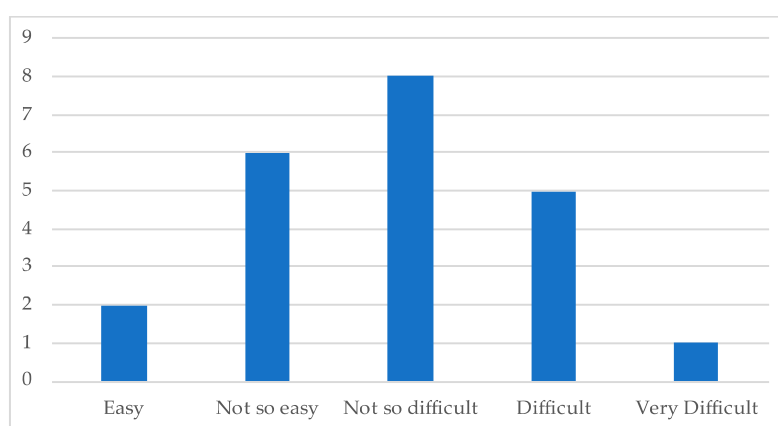


Figure 7. Financial solvency for effluent treatment plant (ETP) operation.

3.4. Barriers to ETP Installation

Aside from non-compliance in ETP operation, there are many companies without an ETP altogether. Belal and Roberts [17] reported that among the top 100 companies listed on the Dhaka Stock Exchange, only five of them disclosed having ETPs. Figure 8 depicts the countries of origin of the ETPs. As shown, all were imported from abroad. In Table 1, which shows installation cost and import cost, some companies could provide only the installation cost and some could provide only the total cost of installation and importation. Thus, the descriptive statistics are not consistent with each other. In cases where both the installation and import costs were listed, the sum calculated was the estimation of total cost. Figure 9 shows the financial solvency for ETP installation. About 70% of the responding companies seemed to feel that ETP installation is financially manageable. Figures 10 and 11 show the responses about the barriers to and difficulties in ETP installation. These Figures suggest that the dominant barriers to ETP installation are at the import stage, rather than the construction stage. They indicate that companies have to import ETPs because they are not available locally. The companies also have to find the information about purchasing ETPs for themselves. In some cases, where the companies had recommendations from foreign buyers, imported ETPs from European countries were suggested. Figure 12 shows how the price differed when the responding companies were given suggestions by buyers about which ETPs to purchase as compared to when they obtained the information for themselves. In most cases, the price of a recommended ETP was higher than that found with their own search. Along with the unavailability of ETPs locally, the results suggest that the companies had to choose their ETPs from among limited options and the additional cost due to import fees tends to cause more financial burdens for the companies.

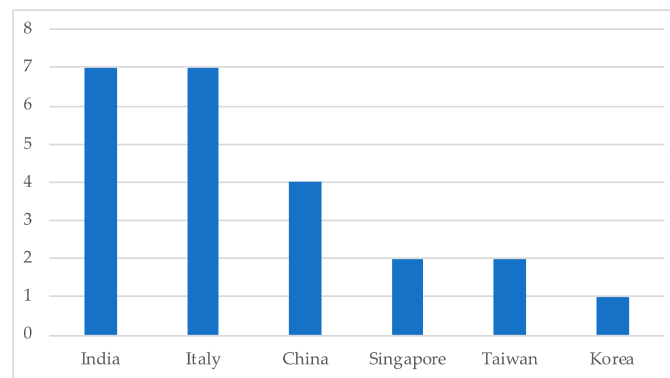


Figure 8. Country of origin of effluent treatment plant (ETP) equipment.

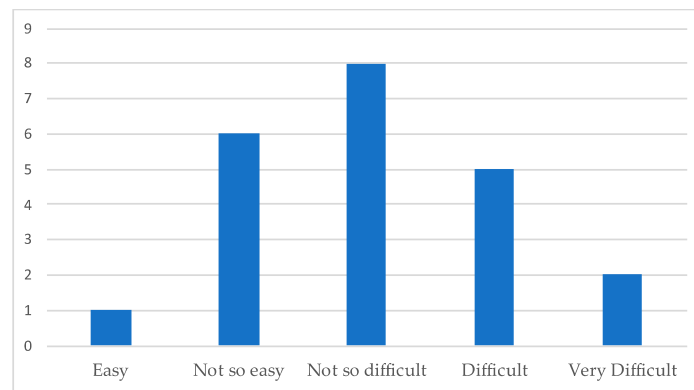


Figure 9. Financial solvency for effluent treatment plant (ETP) installation.

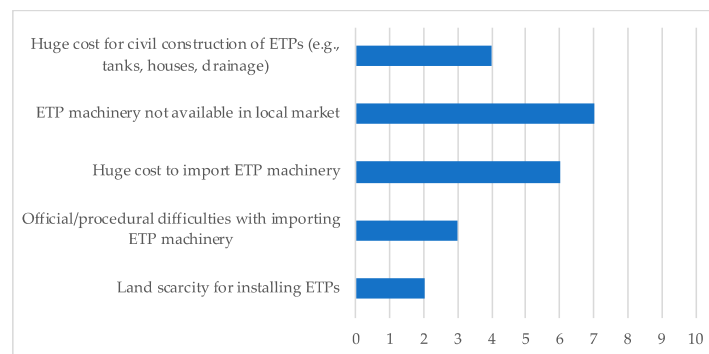


Figure 10. Barriers to or difficulties in effluent treatment plant (ETP) installation (1st rank).

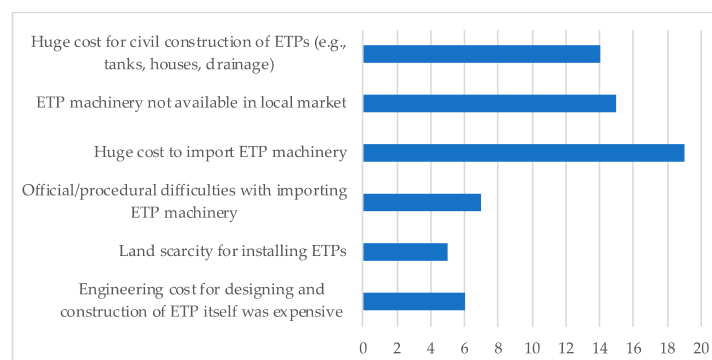


Figure 11. Barriers to or difficulties in effluent treatment plant (ETP) installation (1st–3rd rank).

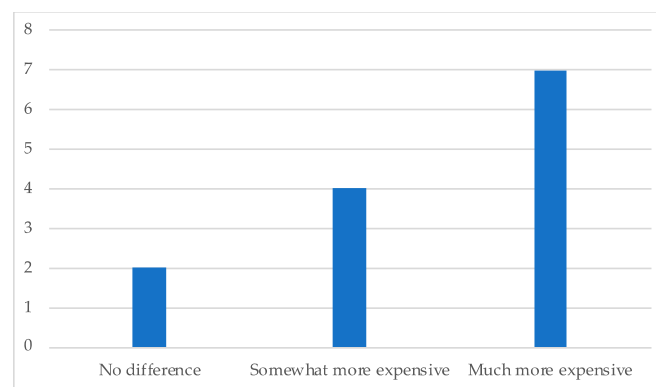


Figure 12. Difference in price between buyer's recommendation and companies' own search results.

4. Discussion

4.1. Institutional Drawbacks

The results were consistent with previous findings: The low willingness of companies to engage in environmental protection activities and inadequate monitoring and enforcement by the government authorities induced the non-compliance of the textile companies. An additional finding in our survey was that the limited availability of effluent treatment plants (ETPs) in the country could be another critical factor hindering environmental compliance. As Figure 1 indicates, the textile companies are under pressure from foreign buyers to follow the environmental regulations. However, according to the informal interviews from our survey, foreign buyers tend not to believe in the quality of products (such as ETPs) made in Bangladesh and are not interested in using domestic products. This, combined with the fact that ETPs were not available in the local market, resulted in textile companies importing ETPs from abroad. Thus, there was no demand to increase the manufacturing of ETPs in the country. In consequence, installation, engineering maintenance, and chemical refills are currently all outsourced to foreign manufacturers and, hence, the requisite human resources and chemical materials are imported from abroad. Furthermore, the situation is exacerbated by the import taxes. In the financial year 2017–2018, the customs duty for ETPs was 26.27% against the buying price in the country of origin [23]. And, in addition to the cost in the country of origin and customs duty, companies have to bear shipping costs, road transport costs, both for the exporting and importing country, banking charges for a letter of credit (L/C), and so on. There is no doubt that such additional costs are a big barrier which would not exist if ETPs were produced in the country.

In environment–economic theory, pro-environmental behaviour is not considered rational as it is assumed that individuals act to pursue only their own short-term economic benefits [24]. Therefore, the theory concludes that state penalties or subsidies are essential to manage environmental and resource problems. Regarding penalties, monitoring and enforcement have been implemented in Bangladesh, although they are inadequate and not sufficiently institutionalized. What our findings suggest is that it is not so difficult for companies to install and operate ETPs in terms of the cost. Also, financial solvency is not a barrier. Therefore, by making the monitoring and regulation strict, environmental compliance could be achieved for those who can afford to purchase and operate ETPs. However, this does not apply to small companies. So, even if monitoring and enforcement become more institutionalized and stricter, there will be a certain portion of companies that cannot comply with the regulations. In consequence, it is not hard to imagine that many small companies will be shut down and many workers will lose their jobs at these factories if the government only strengthens the regulations and does not provide any support to the small companies. In addition, even if the companies bear the cost for environmental protection, they will lose competitive power in the global market due to the price increase that will result from incurring the cost. If Bangladesh wants to keep the garment industry a driving force of the economy, the government should subsidize the environmental

protection measures. Nevertheless, what the government has been doing is opposite to this: Imposing a high import tax on the environmental protection technology and equipment.

Based on the above, we can conclude that textile companies lack a strong will to protect the environment, but this is not the only the reason for the non-compliance of the whole industry. There are fundamental problems in government institutions stemming from their myopic view: The high import tax, infrequent monitoring and enforcement, and no institutionalized subsidy scheme that encourages voluntary central effluent treatment plant construction. Such a myopic perspective also might have interfered with strengthening the engineering sector for enhancing domestic ETP provision and inducing technology transfer from abroad. What happened in the tannery sector provides a good example of government ad hoc actions. The first judicial requirement was stated in July 2001: The High Court ordered the Hazaribagh tanneries to adopt adequate measures to control pollution within one year. Following the directives of the court, the government published a plan to create a new tannery industrial complex, Savar, and to shift tannery factories there by December 2005 [25]. Since the first determination, the High Court repeatedly ordered tanneries to move and the government to take relevant countermeasures to solve the problem, but the process was so slow that the deadline was extended repeatedly. The design for the tannery site in Savar was not approved until April 2013 [26] and in 2017, the government finally began to relocate the tanneries [27]. However, the relocated tannery factories started operation before the completion of the CETP construction, and it was reported that factories were releasing chemicals into the Daleshwari River and dumping toxic waste in open fields [28]. As of February 2019, construction still had not been completed.

4.2. An Indian Comparison

For further discussion, it is worth comparing this environmental problem to that in another country. India would be a good reference because it is adjacent to Bangladesh and has similar resources and socio-economic climate. And, in the 1990s, India experienced a similar issue to that which Bangladesh is currently facing. In 1974, the parliament of India passed the Water Act that provided them enormous powers, including the closure of factories for violation of the tolerance limits. However, the enforcement was weak, partially because of the concerns of the government that strict enforcement would affect export earnings and employment generation from the tannery and textile industries [29]. In the state of Tamil Nadu, where the environmental adjustment (particularly in the leather industry) began relatively early in India, the Water Act was adopted in 1981, and a fiscal plan for setting up CETPs was prepared in 1986. However, essential actions were not taken until 1995 [29]. In the meantime, in 1989–1990, Germany banned the import of leather items containing more than 5 mg/kg of pentachlorophenol, and in 1994, azo dyes were added to the ban. These environmental standards arrived at the same time as the tannery industry was coping with a domestic crisis triggered by a Supreme Court decision [30]: On 1 May 1995, the Supreme Court, adjudicating on complaints brought by farmers about groundwater pollution due to effluents from tannery industries, ordered the closure of factories with no ETP or not connected to CETPs [29]. Following this judgment, the Supreme Court directed the tanneries in Tamil Nadu to set up CETPs or ETPs on or before 30 November 1996. The order sped up the establishment of CETPs [31]. In addition, the subsidy scheme initiated by the Ministry of Environment and Forests in 1991 for CETPs was a great support: 25% of the cost was contributed by each of the central government and state government, 20% came from beneficiaries, and the rest was covered by bank loans [32]. Around the time of these incidents and the judgment by the Supreme Court, a number of CETPs started functioning in tannery clusters in Tamil Nadu: One in 1991, six in 1995, one in 1996, and four in 1997 [31]. The textile sector in Tamil Nadu followed this movement, and a similar process took place for ETP establishment [31]. It has been reported that more than 150 CETPs were established all over India by 2015 under the subsidy scheme [32]. Thus, India constituted the financial scheme at about the same time that it faced a critical situation, although it took effect 14 years after the Water Act was adopted in the case of Tamil Nadu. There were some other measures that the Indian Government implemented: Reducing import duties on dyes

and chemicals, and negotiating extensive technology transfers from Germany, thus establishing a world-class testing center in India in 2002 [29]. In terms of technology development, one company in Tamil Nadu first achieved ISO 9001 Certification in 1999 for its construction of a CETP [33]; hence, this suggests that India succeeded in managing to tailor the necessary technologies by themselves.

Compared with the Indian experience, we again note that the Bangladesh Government has not made essential responses to the situation. In the Indian case, the penalty, subsidy, and technological transfer worked harmoniously in a short period. It took 10 years after the Water Act was adopted in Tamil Nadu in 1981 until the first CETP began operating—and one to two years after Germany implemented the first ban in 1989–1990. On the other hand, 24 years after the Environmental Conservation Act was adopted in Bangladesh, the problem was still not resolved. What we can further realize from Indian history is that it was a series of incidents (rather than just one) which provided external and internal pressure to trigger the movement toward environmental compliance. In the case of Bangladesh, so far, no countries have had a ban on importing textile and tannery products from Bangladesh nor tried to provide the technical support as Germany did in the Indian case. The Indian farmers who made complaints against the tannery industry must have had more political power than the extreme victims in Bangladesh who live in slums along the rivers in Dhaka. Local society does not pay much attention to them as they are considered ultra-poor, to be illegally occupying the land, and a group whose livelihoods contribute little to the country's growth. In the case of Bangladesh, internal pressure may be unlikely due to the weak political power of the victim citizens and the highly corrupted ecology of the country, ranked 13th lowest on Transparency International's Corruption Perceptions Index, and which has been more or less the same for the last five years [34]. Therefore, external pressure is essential for change.

4.3. Towards Effective Environmental Compliance

Foreign buyers may say that their contractors installed ETPs and they frequently monitor them. But it is quite impossible to check the effluent status constantly during factory operation. And, as has been pointed out, factories cheat and run ETPs just occasionally when the Department of Environment or foreign buyers visit. What makes the problem even more complicated is the local structure of the industry. The major textile domestic companies usually have many subcontractors, most of which are small units and cannot afford ETPs. So, even though foreign buyers are serious about environmental compliance, those small units may escape their watch. In addition, as we saw in the tannery sector, the government has been taking so long on non-essential remedies that it can be regarded as stalling on the issue. Hence, foreign buyers need to understand the reality of the situation and have a holistic view of the problem. Furthermore, they should not only pressure their contractors and the government, but also judge the compliance status with explicit criteria such as the quality of river water, which might be the only reliable measure of environmental compliance due to the nature of the problem. Because having clean rivers is the accumulated consequence of pro-environmental behavior, it requires the collective action of the whole industry. Conditions might be too strict and too demanding at the moment, but the government and industry cannot escape from situations where foreign buyers are blindly taking part in imposing external costs on the local society, especially on the poor living along the river.

5. Conclusions

To better understand the current non-compliance situation in the textile industry in Bangladesh, primary data was collected from 23 textile companies. The results indicate that the low willingness of companies to engage in environmental protection activities is one root cause of the current environmental pollution. However, the survey results also revealed many possible drawbacks in the country's institutions that did not motivate companies to comply with the environmental regulations: The high import tax, inadequate monitoring and enforcement by the government authority, and no explicit subsidy scheme (such as the one India institutionalized). All are due to the myopic view of the

government in problem solving. Such an attitude might have hindered the domestic engineering sector from being capable of producing effluent treatment plants (ETPs) on their own. As a consequence, companies have to import machines and other resources, which require additional time and money and are viewed as barriers to installing ETPs by the textile companies. If the government had sought the technology transfer from abroad or any developed countries had offered technical support around the time when the High Court made its first judicial decision in 2001, then at least Savar would not be like it is today. They also could have learned good lessons from the adjacent country, India, which experienced a similar issue at the time.

We conclude that external pressure is essential for Bangladesh to change. Foreign buyers and international society have been applying pressure, but the present situation tells us that it has not been enough. Our suggested solution is that foreign buyers, individual countries, or international society should have a certain objective measure to determine the situation. The quality of the river water might be one candidate if environmental non-compliance cannot be investigated by checking products individually or effective monitoring cannot be expected. It is also reasonable to consider the characteristics of the industry structure, where many small companies are under the umbrella of the major companies. The complete information about their contribution to the industry may be hard to obtain. In such a situation, the institutionalized monitoring itself would be difficult. Improving the quality of the river water is not easy and will take time because it requires the collective action of the whole industry. But it would not take as long a time as the country has already spent, once the concerned bodies treat the issue seriously. History has already proved this.

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